

**NARROW BANDWIDTH, PICO-SECOND, OPTICAL PARAMETRIC OSCILLATOR-
MASTER OSCILLATOR POWER AMPLIFIER SYSTEM AND METHOD OF
OPERATION OF SAME**

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Abstract of the Disclosure

10 A synchronously pumped optical parametric oscillator generates pulses with
duration 25 ps and repetition rate of 10 Hz. The bandwidth of the radiation is 1.36 cm^{-1} ,
close to the Fourier limit. A single pulse from each oscillator is further amplified with an
optical parametric amplifier obtaining pulse energies up to 3.7 mJ. This source can be
tuned between 410 nm - 2000 nm. The system is not a laser but an optical parametric
oscillator where amplification is obtained in a parametric process rather than by
population inversion. The oscillator is pumped by a pulse train from a Nd:Yag laser. In
15 each roundtrip the bandwidth of the radiation is reduced by a grating-mirror assembly.
After a number of roundtrips a close to ideal pulse is obtained. This single pulse is then
amplified by an optical parametric amplifier obtaining a single tunable narrow bandwidth
pulse with a duration of about 25 ps.